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Sailor

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(54) **TRACK CLEANING CAR**

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(22) Filed: **Nov. 29, 2011**

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(51) **Int. Cl.**
B61F 19/00 (2006.01)

(52) **U.S. Cl.** **104/279**; 105/1.5

(58) **Field of Classification Search** 104/279; 105/1.5, 394; 15/49.1, 54, 78, 82, 87
See application file for complete search history.

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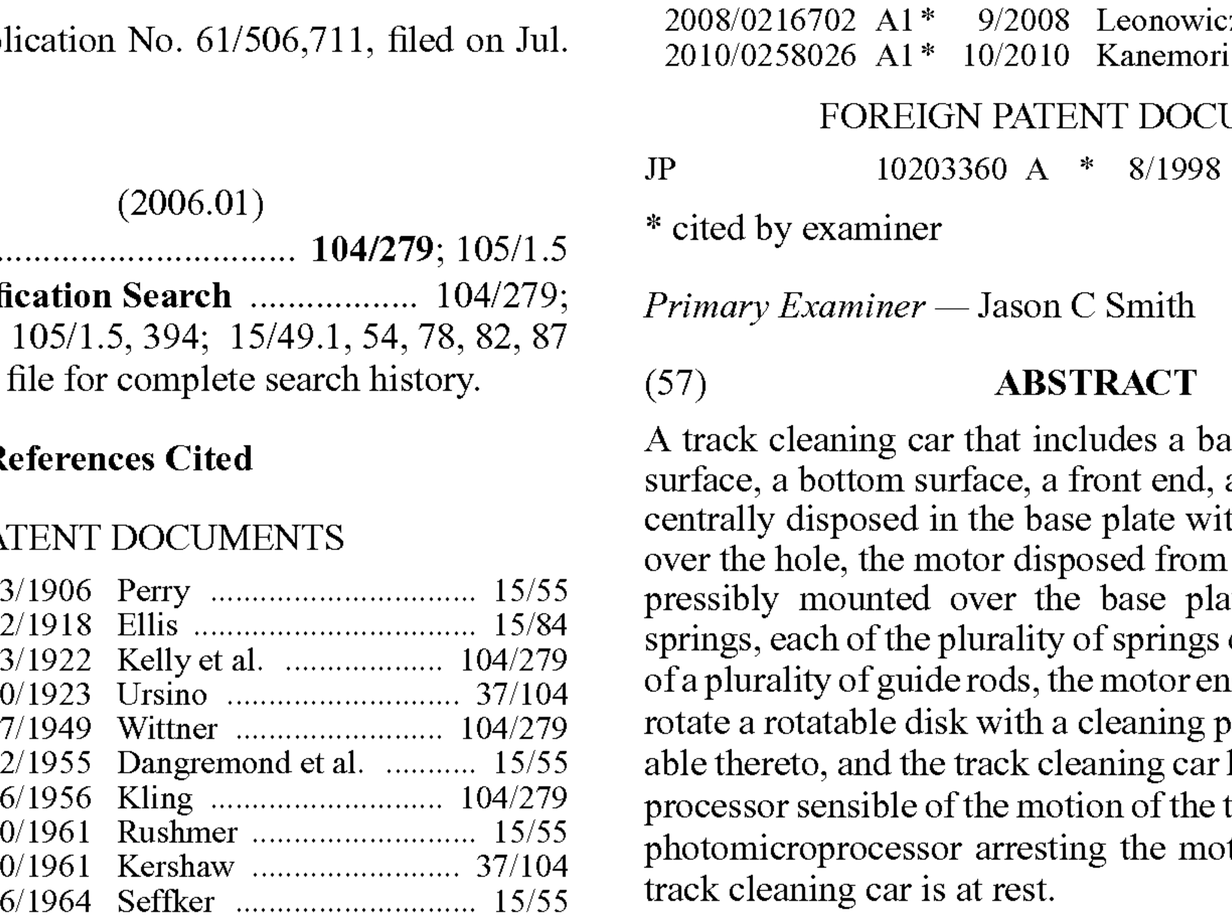
Primary Examiner — Jason C Smith

(57) **ABSTRACT**

A track cleaning car that includes a base plate having a top surface, a bottom surface, a front end, and a rear end, a hole centrally disposed in the base plate with a motor suspended over the hole, the motor disposed from a floating plate compressibly mounted over the base plate on a plurality of springs, each of the plurality of springs disposed around each of a plurality of guide rods, the motor engaging a driveshaft to rotate a rotatable disk with a cleaning pad removably attachable thereto, and the track cleaning car having a photomicroprocessor sensible of the motion of the track cleaning car, the photomicroprocessor arresting the motor when sensing the track cleaning car is at rest.

18 Claims, 5 Drawing Sheets



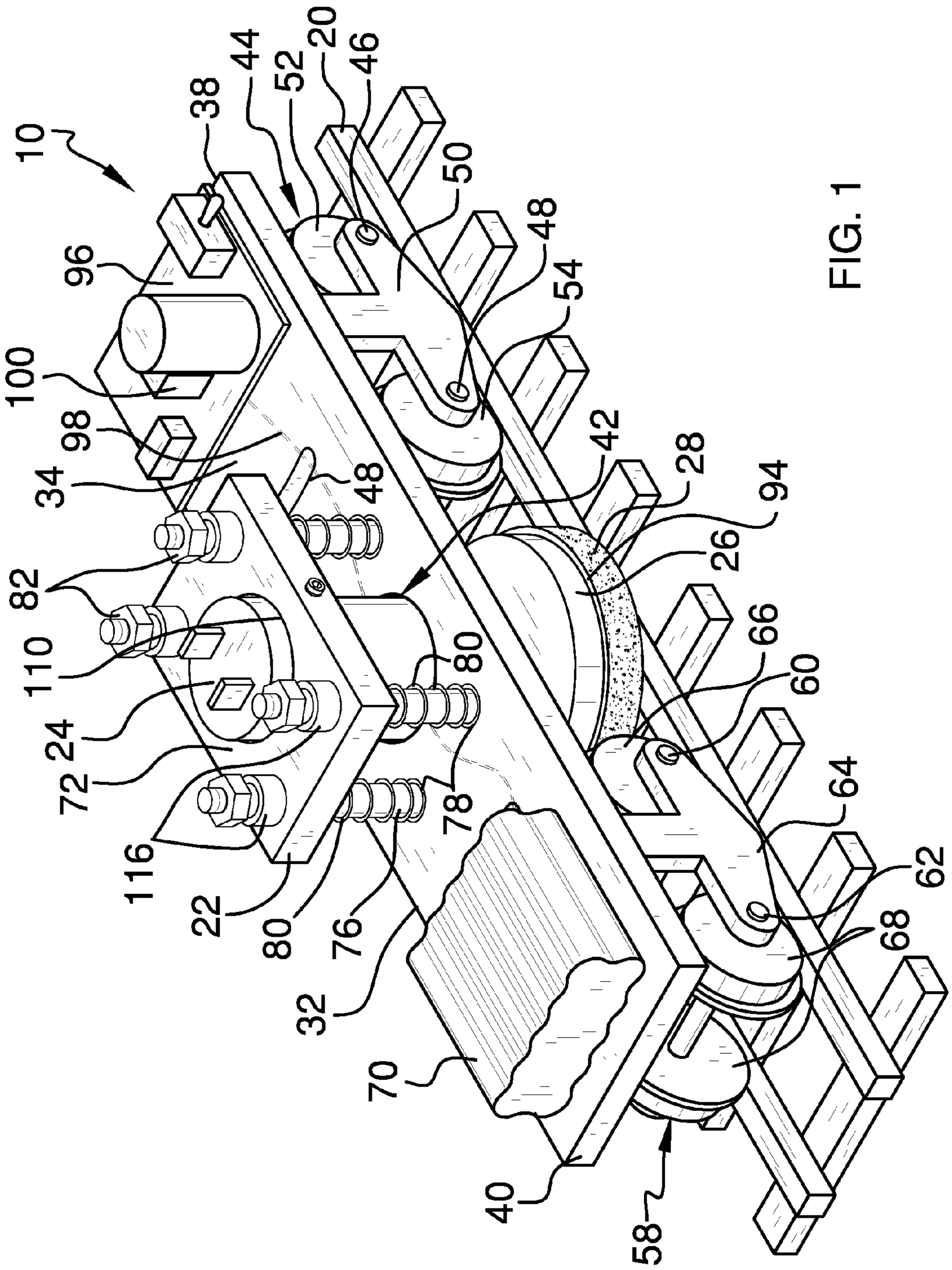

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FIG. 1

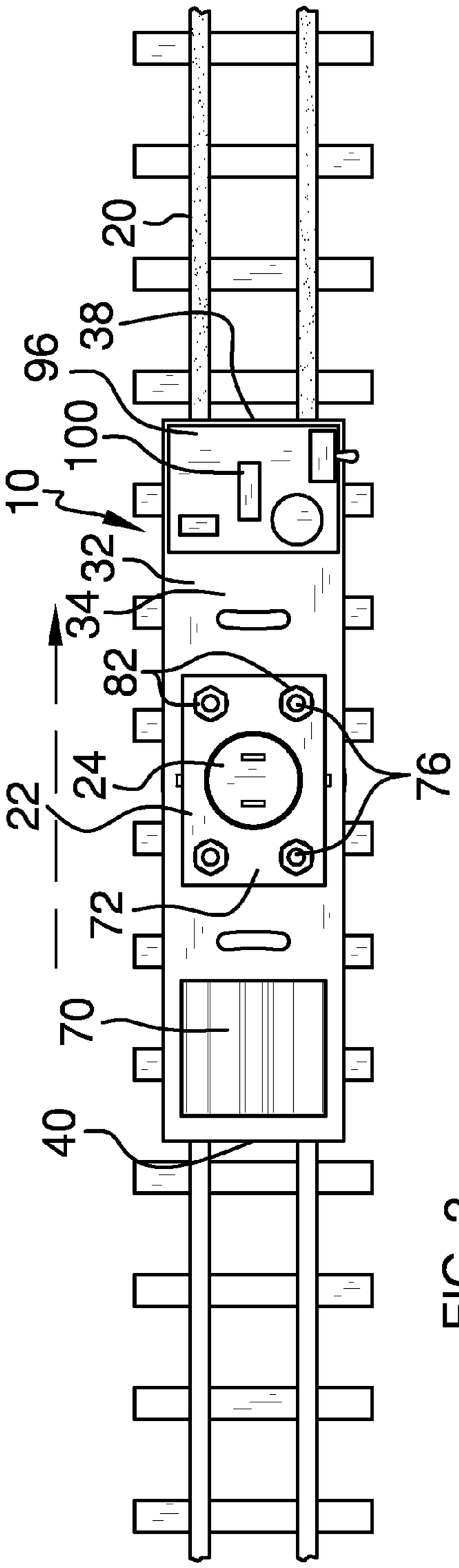
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FIG. 2

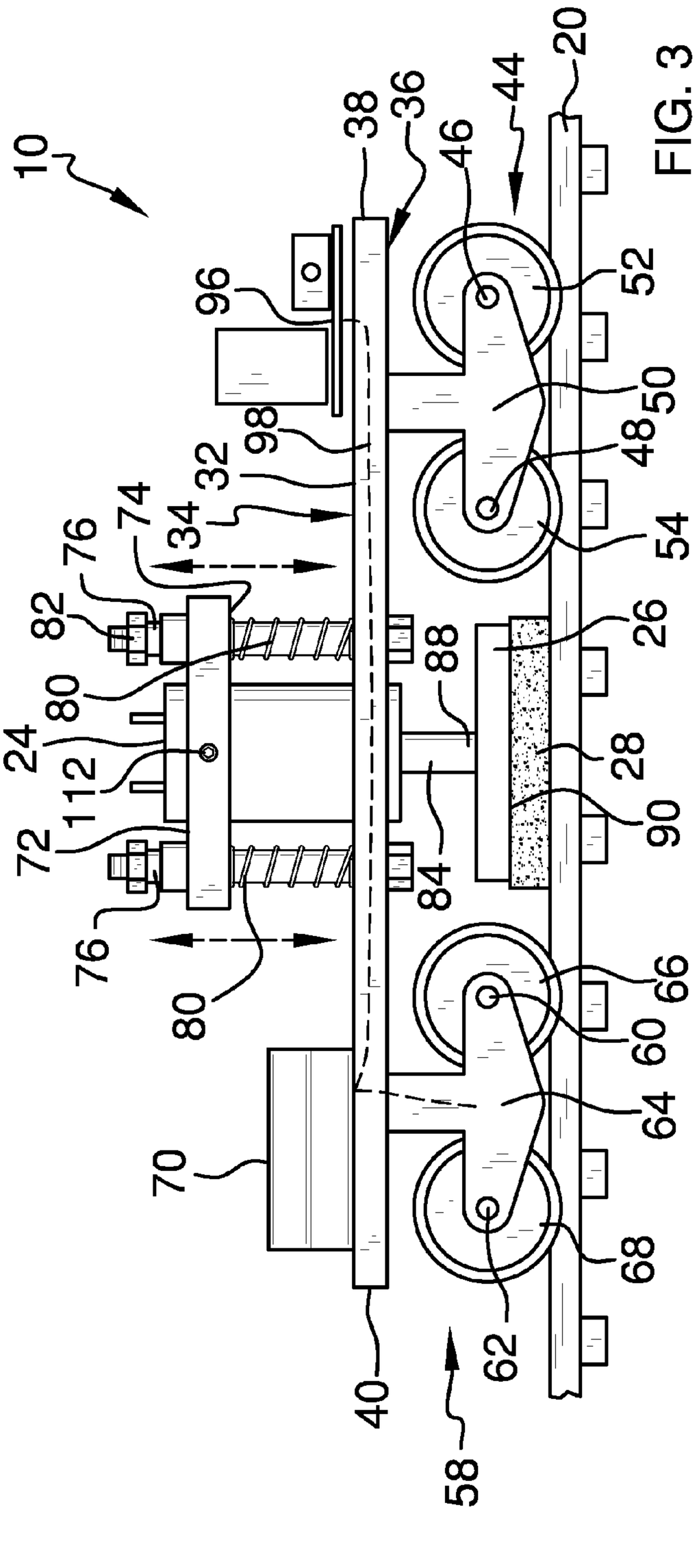
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FIG. 3

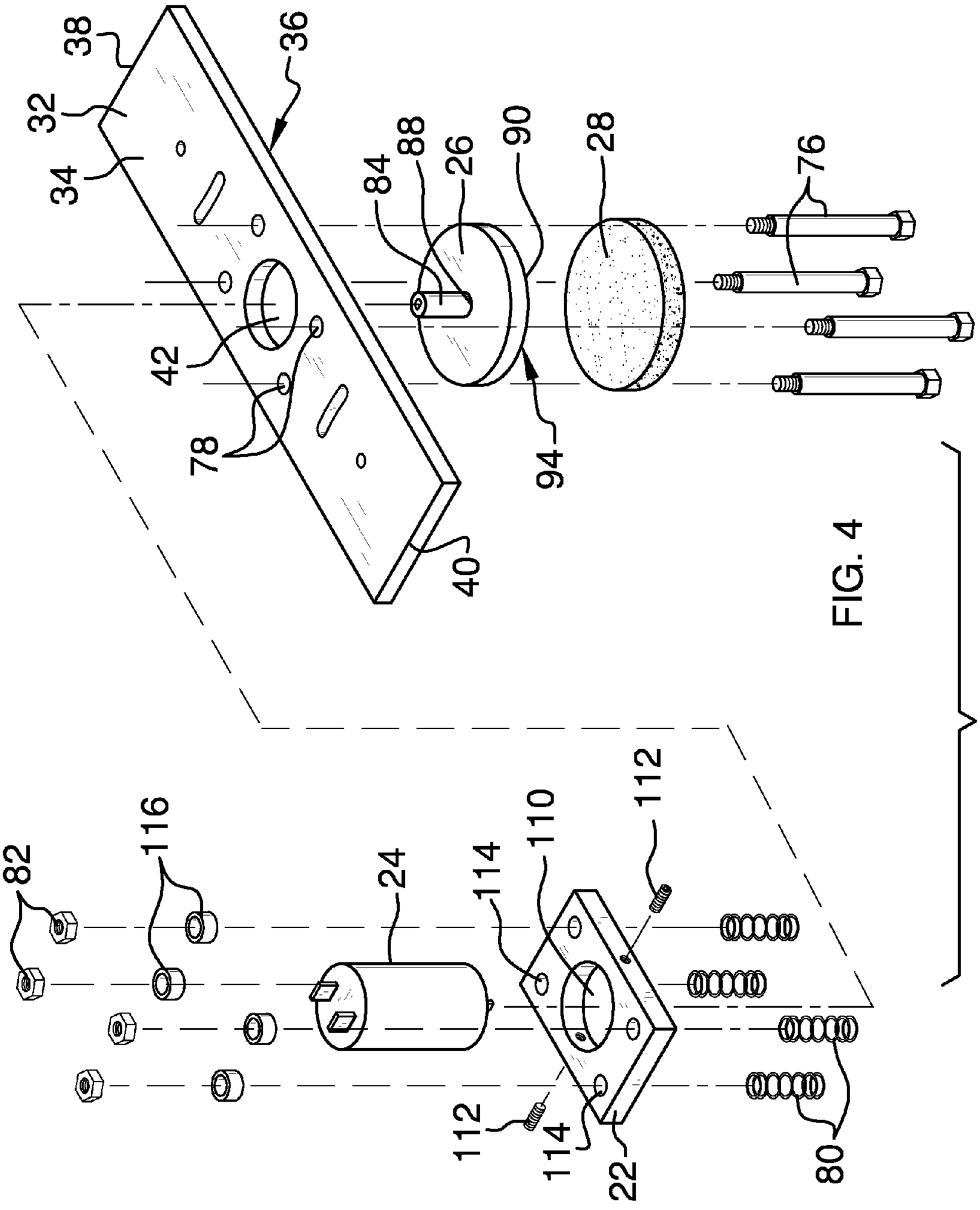
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FIG. 4

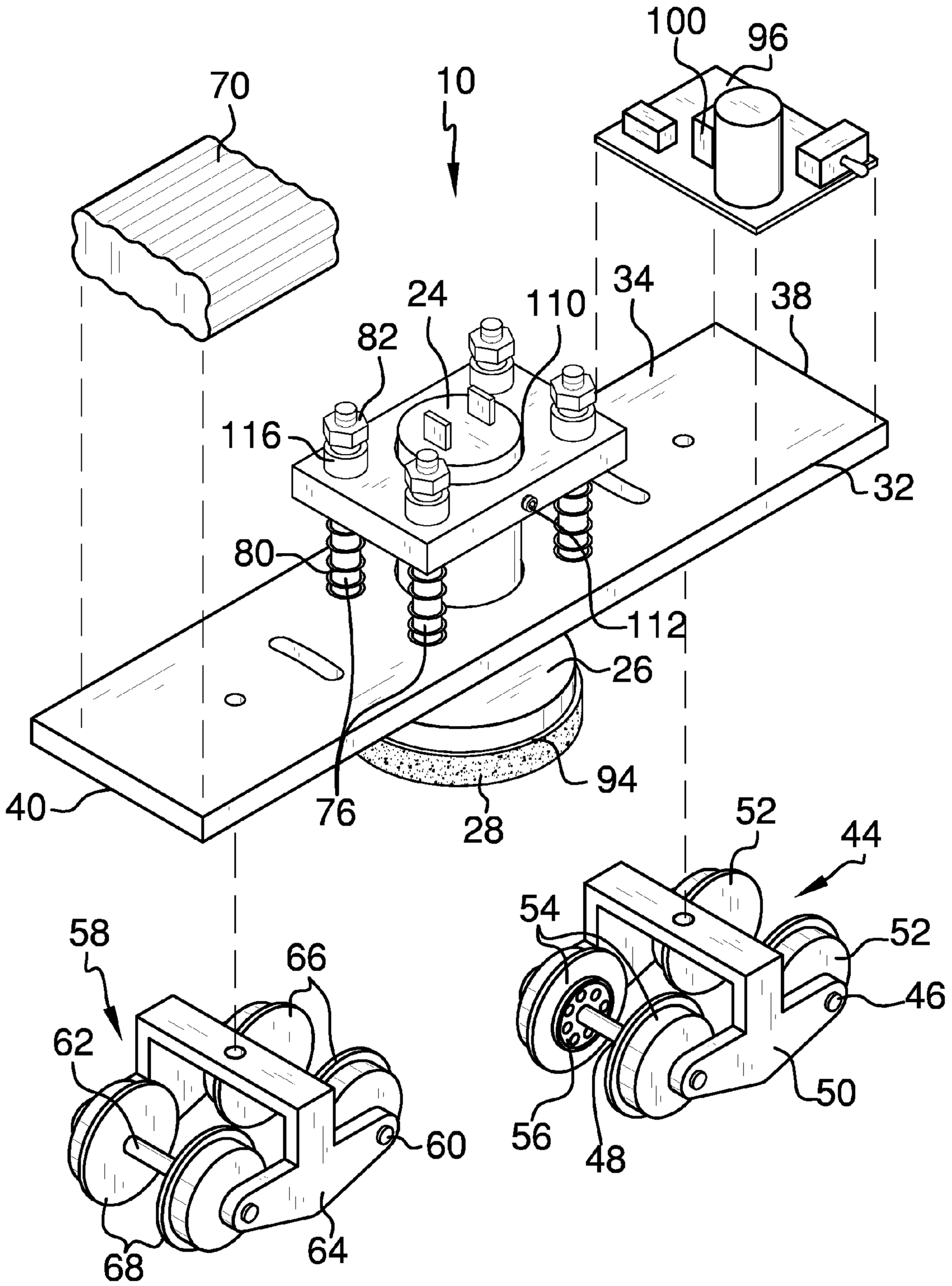
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FIG. 5

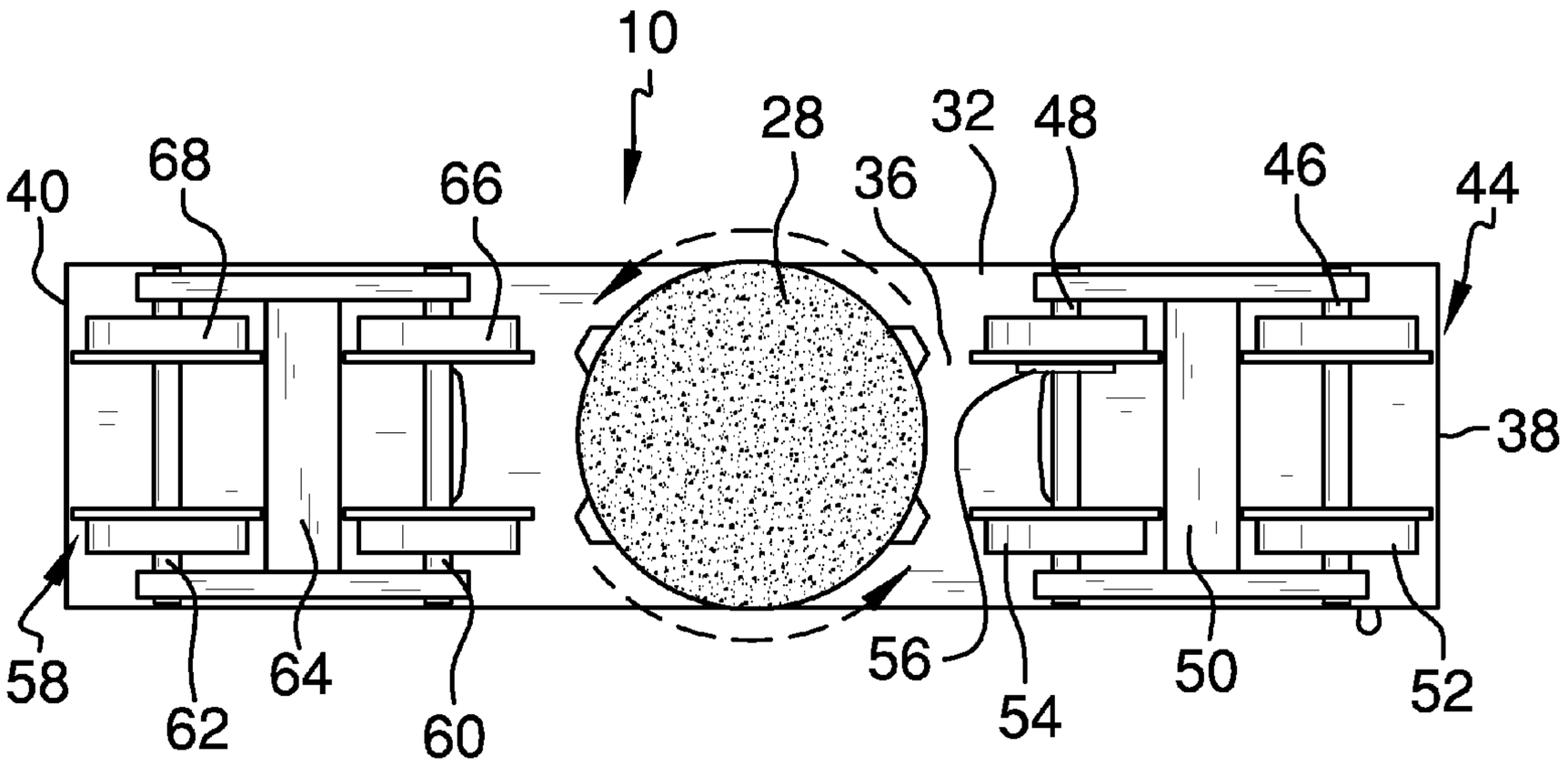
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FIG. 6

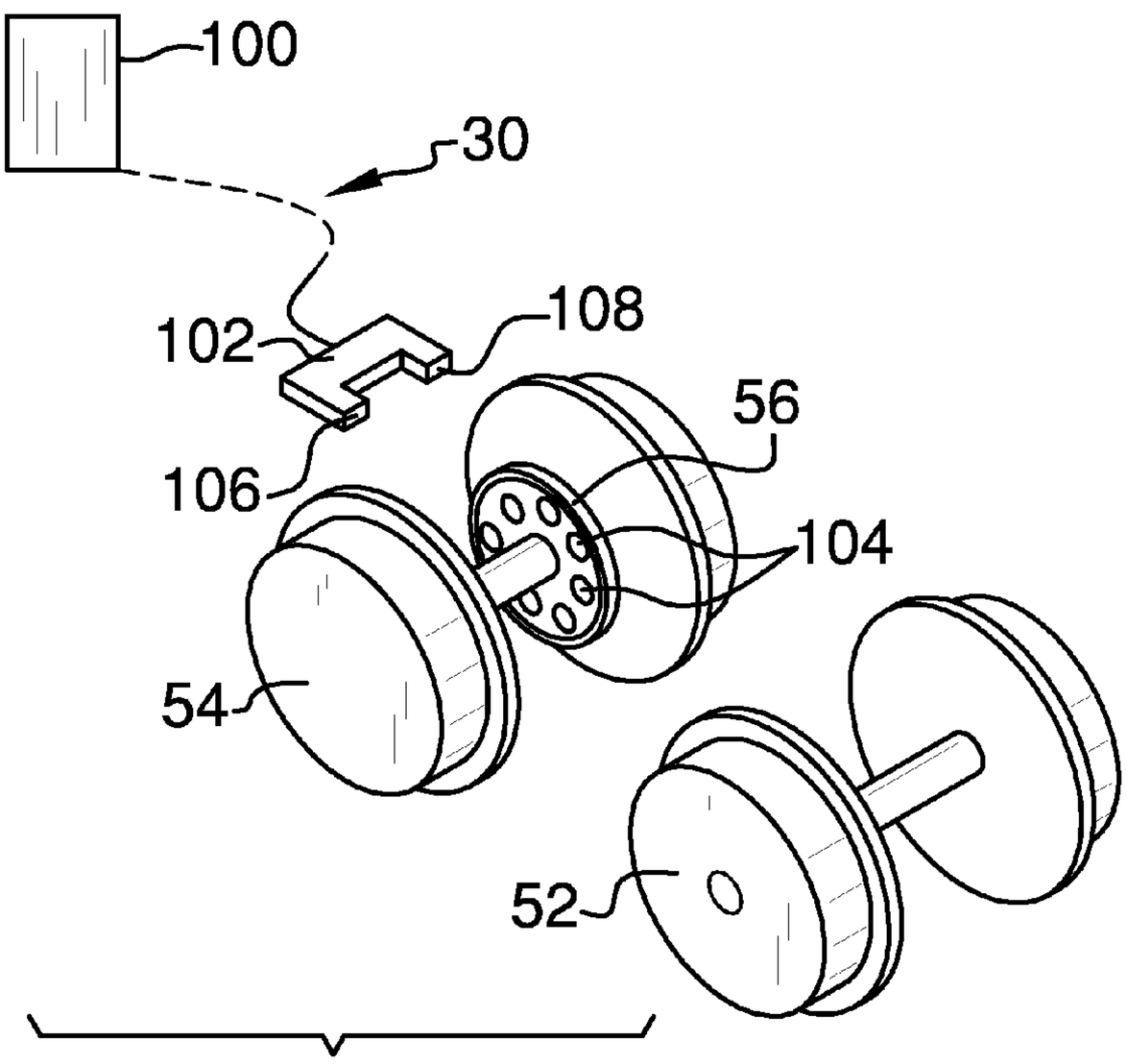
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FIG. 7

TRACK CLEANING CAR

CROSS-REFERENCE TO RELATED APPLICATIONS

U.S. Provisional Application No. 61/506,711 Filed Jul. 12, 2011

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISK

Not Applicable

TO ALL WHOM IT MAY CONCERN

Be it known that I, Michael A. Sailor, a citizen of the United States, have invented new and useful improvements in a track cleaning car as described in this specification. I claim benefit of my U.S. Provisional Application No. 61/506,711 filed on Jul. 12, 2011.

BACKGROUND OF THE INVENTION

Various types of track cleaning cars are known in the prior art. However, what is needed is a track cleaning car that includes a floating plate compressibly engaging a cleaning pad with an extant rail track, the cleaning pad releasably attachable to a rotating disk disposed on a lower end of a driveshaft powered by a motor, said motor in operational communication with a control panel and a photomicroprocessor, which photomicroprocessor interrupts the motor when the track cleaning car is not in motion.

FIELD OF THE INVENTION

The present invention relates to a track cleaning car, and more particularly, to a track cleaning car that a floating plate compressibly engaging a cleaning pad with an extant rail track, the cleaning pad releasably attachable to a rotating disk disposed on a lower end of a driveshaft powered by a motor, said motor in operational communication with a control panel and a photomicroprocessor, which photomicroprocessor interrupts the motor when the track cleaning car is not in motion.

SUMMARY OF THE INVENTION

The general purpose of the present track cleaning car, described subsequently in greater detail, is to provide a track cleaning car which has many novel features that result in a track cleaning car which is not anticipated, rendered obvious, suggested, or even implied by prior art, either alone or in combination thereof.

As an avid railroad gardener, I have enjoyed using a model railroad in the landscaping at my home. The greatest problem I have encountered is a dirty track. In order for a locomotive to run smoothly over track placed in landscaping, the track must be clean. Many times I've had to resort to cleaning the track by hand with chemical cleaners and a cleaning pad. The chemicals are often deleterious to plants alongside the track, and cleaning by hand is laborious and time consuming.

Cleaning sections of track through tunnels and over bridges by hand is particularly difficult, and potentially dangerous.

Having conducted a thorough comparison of available track cleaning cars, I noted several problems I sought to address in the present invention. Most track cleaning cars evinced in the prior art have a cleaning apparatus independent of the motion of the cleaning car itself. In other words, when such cleaning cars come to a stop, the cleaning apparatus continues to operate, rendering increased wear and damage to the track section atop which the cleaning car has come to rest.

The present invention, therefore, addresses this problem while combining additional features and elements to provide a useful improvement to the art. The present track cleaning car includes a parallelepiped base plate having a top surface, a bottom surface, a front end, and a rear end. A hole is centrally disposed in the base plate, and a motor is suspended through the hole depending from a floating plate disposed above the base plate in a plane parallel with the top surface. The floating plate is compressibly mounted above the base plate by means of a plurality of guide rods, each of the plurality of guide rods vertically disposed through each of a plurality of guide holes disposed in the base plate. Each of a plurality of springs is disposed around each of the plurality of guide rods between the floating plate and the base plate, each of the plurality of springs compressibly engaging the floating plate above the base plate.

A rotatable driveshaft is engageable by the motor, the driveshaft projected through the hole. A rotatable disk is disposed at a lower end of the driveshaft, the rotatable disk disposed in a plane parallel with the bottom surface of the base plate. A cleaning pad is releasably attachable to a lower surface of the rotatable disk.

The motor is in operational communication with a control panel and a battery mounted on the base plate top surface. The motor is alternately powered by an extant powered rail track, if the present track cleaning car is operated on a powered track. When the motor is activated, the cleaning pad is rotated by means of the driveshaft engaging the rotatable disk. The floating plate thusly compressibly engages the cleaning pad upon an extant track, the springs limiting the pressure of the cleaning pad upon the track while allowing upward movement of the cleaning pad. Further, the cleaning pad is removably fastenable to the rotatable disk, enabling replacement and use of different gauge cleaning pads, as desirable when cleaning tracks under a variety of conditions requiring cleaning and polishing.

A first wheel assembly is disposed on the base plate bottom surface proximal to the front end. The first wheel assembly includes a first axle and a second axel rotatably disposed in parallel within a forward truck. A first pair of wheels is disposed endwise on the first axle, and a second pair of wheels is disposed on the second axle. A counter wheel is disposed on the second axle, the counter wheel disposed parallel the second pair of wheels. When the second pair of wheels rotate, the counter wheel rotates synchronously.

A photomicroprocessor is in operational communication with the battery, the counter wheel, and the motor. The photomicroprocessor includes a sensor and a microprocessor. The sensor has a first end and a second end. The first end radiates a beam of light which is registered at the second end. The counter wheel has a plurality of perforations disposed circumferentially within the counter wheel. The sensor is configured to shine the beam of light through each of the plurality of perforations as the counter wheel rotates. Thusly, a frequency of pulses is sensible at the sensor second end. The frequency of the pulses corresponds to a range of motion of the track cleaning car. When the pulses of light are registered

statically, or are statically absent at the sensor second end, the track cleaning car is at rest. The sensor relays a signal to the microprocessor. The microprocessor arrests the motor when the track cleaning car is not in motion, thereby disabling the rotating disk when the track cleaning car is at rest.

A second wheel assembly is disposed on the base plate bottom surface proximal to the rear end. The second wheel assembly drives the track cleaning car in a forward or rearward direction, as desired. The second wheel assembly is powered by the battery disposed on the base plate and alternately by an extant powered rail track. However, the present track cleaning car is not envisioned to be self-propelled, but rather pulled and alternately pushed by an extant engine, as desired.

A control panel is also disposed on the base plate top surface. The control panel is in operational communication with the motor, the photomicroprocessor, the battery, and the second wheel assembly. The control panel is in operational communication with the second wheel assembly and selectively controls the speed of the track cleaning car in a forward and alternately rearward direction. The control panel is also in operational communication with the motor, and the speed of the rotatable disk is controllable by means of the control panel, as desired.

In the preferred embodiment herein specified, the battery is envisioned as a rechargeable 12 volt Nimh battery. The battery is rechargeable by means of an external power source or while the track cleaning car is operated upon an extant powered rail track.

Cleaning track by hand is hard work and can take several hours. Existing prototypes of the present track cleaning car can clean 100 feet of track in approximately three to six minutes.

Thus has been broadly outlined the more important features of the present track cleaning car so that the detailed description thereof that follows may be better understood and in order that the present contribution to the art may be better appreciated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a track cleaning car.

FIG. **2** is a top view of the track cleaning car.

FIG. **3** is a side view of the track cleaning car.

FIG. **4** is an exploded view of a motor disposed within a floating plate.

FIG. **5** is an exploded view a first wheel assembly, a second wheel assembly, a control panel, and a battery pack attachable to a base plate.

FIG. **6** is a bottom view of the track cleaning car.

FIG. **7** is an exploded view of a photomicroprocessor.

DETAILED DESCRIPTION OF THE DRAWINGS

With reference now to the drawings, and in particular FIGS. **1** through **7** thereof, an example of the instant track cleaning car employing the principles and concepts of the present track cleaning car and generally designated by the reference number **2** will be described.

Referring to FIGS. **1** through **7**, a preferred embodiment of the present track cleaning car **10** is illustrated.

The present track cleaning car **10** is devised to operate on an extant rail track **20** for the purposes of cleaning said rail track **20**. The present track cleaning car **10** includes a floating plate **22** with a motor **24** disposed thereon, which motor **24** operationally drives a rotatable disk **26** with a removable cleaning pad **28** configured to contact the extant rail track **20**, as will be described in this detailed description. Further, a photomicroprocessor **30** is in operational communication with the motor **24**, the photomicroporcessor **30** arresting the motor **24** when sensing the track cleaning rail car **10** is not in motion.

The track cleaning car **10** includes a parallelepiped base plate **32** having a top surface **34**, a bottom surface **36**, a front end **38**, and a rear end **40**. The base plate **32** has a hole **42** centrally disposed therethrough. A first wheel assembly **44** is disposed on the base plate **32** bottom surface **36** at the front end **38**.

The first wheel assembly **44** includes a first axle **46** and a second axle **48** disposed in parallel, the first **46** and second **48** axles disposed rotatably within a forward truck **50**. A pair of first wheels **52** is disposed endwise upon the first axle **46** and a pair of second wheels **54** is disposed endwise upon the second axle **48**. A counter wheel **56** is disposed in parallel with the pair of second wheels **54**. The counter wheel **56** is rotated synchronously with the pair of second wheels **54**. The photomicroprocessor **30** is disposed on the forward truck **50** in operational communication with the counter wheel **56**. The photomicroporcessor **30** is configured to arrest the motor **24** when sensing the counter wheel **56** is not turning, as will be described subsequently.

A second wheel assembly **58** is disposed on the base plate **32** bottom surface **36** at the rear end **40**. The second wheel assembly **58** includes a third axle **60** and a fourth axle **62** likewise disposed in parallel, the third **60** and fourth **62** axles disposed rotatably within a rearward truck **64**. A pair of third wheels **66** is disposed endwise on the third axle **60** and a pair of fourth wheels **68** is disposed endwise on the fourth axle **62**. The second wheel assembly **58** is operationally engaged by means of a battery **70** and alternately and concurrently by means of an extant powered rail track, as will be described subsequently, to operationally drive the track cleaning car **10** in a forward and alternately rearward direction.

The floating plate **22** is disposed above the base plate **32** top surface **34**, the floating plate **22** disposed in a plane parallel with the base plate **32** top surface **34**. The floating plate **22** has a top side **72** and a bottom side **74**. The floating plate **22** is supported above the base plate **32** by means of a plurality of guide rods **76**. A plurality of guide holes **78** is disposed in the base plate **32** and each of the plurality of guide rods **76** is vertically disposed through each of the plurality of guide holes **78**. Each of a plurality of springs **80** is disposed around each of the plurality of guide rods **76** between the floating plate **22** and the base plate **32**, said springs **80** compressibly engaging the floating plate **22** above the base plate **32**.

A plurality of nuts **82** is included. Each of the plurality of nuts **82** is releasably adjustably disposed atop each of the plurality of guide rods **76** engaging with the floating plate **22** top side **72**, each of the plurality of guide rods **76** extended through the floating plate **22** through each of a plurality of attachment holes **114**. Each of the plurality of nuts **82** adjustably secures the floating plate **22** upon the plurality of guide rods **76** at a desired height above the base plate **32**. Each of the plurality of nuts **82** rests atop each of a plurality of washers **116**.

The motor **24** depends from within a central aperture **110** disposed within the floating plate **22**, the motor **24** centrally disposed upon the base plate **32**. The motor **24** is adjustably secureable within the floating plate **22** by means of a pair of setting screws **112**. The motor **24** projects a rotatable driveshaft **84** through the hole **42**. The rotatable disk **26** is disposed on a lower end **88** of the driveshaft **84**, the rotatable disk **26** having a lower surface **90** disposed in a plane parallel with the base plate **32**. The cleaning pad **28** is removably attachable to

the rotatable disk **26** lower surface **90**. The cleaning pad **28** is releasably fastened to the rotating disk **26** under surface **90** by means of a hook and loop fastener **94**. The cleaning pad **28** is devised to be interchangeable, allowing for replacement pads, as needed, as well as for interchanging cleaning pads of different cleaning gauges, as desirable, when operating the track cleaning car **10** to clean or polish a track under a variety of conditions requiring cleaning or polishing.

The floating plate **22** compressibly engages the cleaning pad **28** with the rail track **20** over which the cleaning car operates and the plurality of springs **80** limit the pressure of the cleaning pad **28** upon the extant rail track **20** over which the cleaning car **10** operates, while engaging the cleaning pad **28** in contact with the track **20**.

The battery **70** is disposed on the base plate **32** top surface **34**, the battery **70** rechargeable when the track cleaning car **10** is in operation upon an extant powered rail track **20** and alternately by means of an external power source (not shown). Thusly, as the track cleaning car **10** operates, the battery **70** may be recharged when the track cleaning car **10** is operated upon an extant powered rail track **20**.

A control panel **96** is disposed on the base plate **32** top surface **34**, the control panel **96** in operational communication with the motor **24**, the battery **70**, the photomicroprocessor **30**, and the second wheel assembly **58**. A plurality of wiring **98** interconnects the motor **24**, the control panel **96**, the battery **70**, the photomicroprocessor **30**, and the second wheel assembly **58**. The control panel **96** is in operational communication with the motor **24** and the rotatable disk **26** is operational at different speeds selectable by means of the control panel **96**. The control panel **96** is in operational communication with the second wheel assembly **58**, and the track cleaning car **10** is operable at different speeds selectable by the control panel **96**. The track cleaning car **10** is operable in a forward direction and alternately a rearward direction, as desired.

The photomicroprocessor **30** is in operational communication with the motor **24**; the photomicroprocessor **30** arresting the driveshaft **26** when the photomicroprocessor **30** senses the counter wheel **56** is not turning. This ensures the rotatable disk **26** is not spinning when the track cleaning car **10** is not in motion in a forward or rearward direction, and lessens potential damage and wear to the track **20** upon which the track cleaning car **10** is operated.

The photomicroprocessor **30** includes a microprocessor **100** in operational communication with the motor **24** and a sensor **102** in operational communication with the counter wheel **56**. The counter wheel **56** includes a plurality of perforations **104** disposed circumferentially within the counter wheel **56**. The sensor **102** detects a beam of light (not shown) radiated from a first end **106** of the sensor **102** at a second end **108** of the sensor **102**. The beam of light is configured to shine through each of the plurality of perforations **104**. When the counter wheel **56** rotates, this beam of light is interrupted—the beam of light configured to shine alternately through each of the plurality of perforations **104** and alternately against the counter wheel **56** as the counter wheel **56** rotates. When the beam of light is constantly registered on the sensor **102** second end **108** and alternately constantly unregistered at the sensor **102** second end **108** a signal is sent from the microprocessor **100** to arrest the motor **24**. The driveshaft **84** is thereby arrested, and the cleaning pad **28** is also arrested. When the light beam is registered as a frequency of pulses, the photomicroprocessor **30** enables the motor **24** to engage the rotatable disk **26**. Thusly, the cleaning pad **28** is only rotated upon the track **20** when the track cleaning car **10** is in forward or rearward motion, as selected by the control panel **96**.

What is claimed is:

1. A track cleaning car comprising:

a parallelepiped base plate comprising a top surface and a bottom surface, a front end and a rear end, the base plate having a hole centrally disposed therethrough;

a first wheel assembly disposed on the base plate bottom surface at the front end, the first wheel assembly comprising:

a first axle and a second axle disposed in parallel, the first and second axles disposed rotatably within a forward truck;

a pair of first wheels disposed endwise upon the first axle;

a pair of second wheels disposed endwise upon the second axle;

a counter wheel disposed in parallel with the pair of second wheels;

a photomicroprocessor disposed on the forward truck in operational communication with the counter wheel;

a second wheel assembly disposed on the base plate bottom surface at the rear end, the second wheel assembly comprising:

a second axle and a third axle disposed in parallel, the second and third axles disposed rotatably within a rearward truck;

a pair of third wheels disposed endwise on the third axle;

a pair of fourth wheels disposed endwise on the fourth axle;

a floating plate disposed above the base plate top surface, the floating plate supported above the base plate by means of a plurality of guide rods;

a motor depending from the floating plate, the motor centrally disposed upon the base plate, the motor projecting a driveshaft through the hole;

a rotatable disk disposed on the driveshaft, the rotatable disk having a lower surface disposed in a plane parallel with the base plate;

a cleaning pad removably attachable to the rotatable disk lower surface;

a plurality of springs, each of the plurality of springs compressibly engaging the floating plate above the base plate;

a battery pack disposed on the base plate top surface;

a control panel disposed on the base plate top surface;

wherein the floating plate compressibly engages the cleaning pad against an extant rail track, the second wheel assembly is driven by the battery pack and alternately an extant powered rail track, the photomicroprocessor is in operational communication with the motor, and the motor rotatably engages the driveshaft only when the cleaning car is in motion.

2. The track cleaning car of claim **1** wherein the photomicroprocessor further comprises:

a sensor comprising:

a first end;

a second end;

a microprocessor;

wherein a beam of light radiated from the first end is registered at the second end and a signal is communicated to the microporcessor.

3. The track cleaning car of claim **2** wherein the counter wheel further comprises:

a plurality of perforations circumferentially disposed within the counter wheel, each of the plurality of perforations configured to enable the beam of light to pass through the counter wheel as the counter wheel rotates, wherein pulses of light are registered on the sensor sec-

ond end and the motion of the track cleaning car is communicated to the microprocessor.

4. The track cleaning car of claim **2** wherein the photomicroprocessor arrests the motor when sensing the track cleaning car is not in motion.

5. The track cleaning car of claim **4** wherein each of the plurality of springs is disposed around each of the plurality of guide rods between the floating plate and the base plate whereby the cleaning pad is compressibly engaged with the rail track over which the cleaning car operates.

6. The track cleaning car of claim **5** wherein the control panel is in operational communication with the motor whereby the rotatable driveshaft is operational at different speeds.

7. The track cleaning car of claim **6** wherein a plurality of wiring interconnects the motor, the control panel, the battery, the photomicroprocessor, and the second wheel assembly.

8. The track cleaning car of claim **7** wherein the control panel is in operational communication with the second wheel assembly to engage the second wheel assembly in a forward and alternately a backward direction.

9. The track cleaning car of claim **8** wherein the battery pack comprises a rechargeable battery, the battery rechargeable upon an extant powered rail track and alternately by means of an external power source.

10. The track cleaning car of claim **9** wherein the battery is a Nimh battery.

11. The base plate of claim **1** further comprising a plurality of guide holes, wherein each of the plurality of guide rods is disposed through each of the plurality of guide holes and the floating plate is compressibly mounted on the plurality of springs.

12. The track cleaning car of claim **11** wherein the cleaning pad is releasably fastenable to the rotating disk under surface by means of a hook and loop fastener.

13. The track cleaning car of claim **12** further comprising a plurality of nuts, each of the plurality of nuts releasably secureable upon each of the plurality of guide rods wherein the floating plate is adjustably secureable at a desired height above the base plate.

14. The track cleaning car of claim **13** wherein the second wheel assembly drives the cleaning car alternately in a forward direction and backward direction.

15. The track cleaning car of claim **14** wherein the control panel is in operational communication with the second wheel assembly to alternately increase and decrease the speed of the track cleaning car.

16. The track cleaning car of claim **15** wherein the battery is a 12 volt battery.

17. The track cleaning car of claim **16** wherein the motor is powered by the battery and alternately an extant powered rail track.

18. A track cleaning car comprising:

a parallelepiped base plate comprising a top surface and a bottom surface, a front end and a rear end, the base plate having a hole centrally disposed therethrough;

a first wheel assembly disposed on the base plate bottom surface at the front end, the first wheel assembly comprising:

a first axle and a second axle disposed in parallel, the first and second axles disposed rotatably within a forward truck;

a pair of first wheels disposed endwise upon the first axle;

a pair of second wheels disposed endwise upon the second axle;

a counter wheel disposed in parallel with the pair of second wheels, the counter wheel comprising:

a plurality of perforations circumferentially disposed within the counter wheel;

a second wheel assembly disposed on the base plate bottom surface at the rear end, the second wheel assembly comprising:

a second axle and a third axle disposed in parallel, the second and third axles disposed rotatably within a rearward truck;

a pair of third wheels disposed endwise on the third axle;

a pair of fourth wheels disposed endwise on the fourth axle;

a floating plate disposed above the base plate top surface, the floating plate supported above the base plate by means of a plurality of guide rods;

a plurality of guide holes, each of the plurality of guide rods vertically disposed through each of the plurality of guide holes;

a plurality of springs, each of the plurality of springs disposed around each of the plurality of guide rods between the floating plate and the base plate, said plurality of springs compressibly engaging the floating plate above the base plate;

a plurality of nuts, each of the plurality of nuts releasably adjustably disposed atop each of the plurality of guide rods;

a central aperture disposed within the floating plate;

a motor depending from the central aperture of the floating plate, the motor centrally disposed upon the base plate, the motor projecting a driveshaft through the hole;

a pair of setting screws releasably adjustably engaging the motor within the central aperture;

a rotatable disk disposed on the driveshaft, the rotatable disk having a lower surface disposed in a plane parallel with the base plate;

a cleaning pad removably attachable to the rotatable disk lower surface;

a rechargeable battery pack disposed on the base plate top surface, the battery pack rechargeable when the cleaning car is in operation upon an extant powered rail track and alternately by means of an external power source;

a photomicroprocessor disposed on the forward truck in operational communication with the motor, the photomicroprocessor comprising:

a sensor having a first end and a second end;

a microprocessor;

a control panel disposed on the base plate top surface, the control panel in operational communication with the motor, the battery, the photomicroprocessor, and the second wheel assembly;

a plurality of wiring interconnecting the motor, the control panel, the battery, the photomicroprocessor, and the second wheel assembly;

wherein a beam of light radiated from the sensor first end is registered at the sensor second end, the sensor configured to shine the beam of light through each of the plurality of perorations in the counter wheel, whereby a frequency of pulsed light is registered and communicated to the microprocessor;

wherein the floating plate compressibly engages the cleaning pad against an extant rail track, the second wheel assembly is driven by the battery pack and alternately an extant powered rail track, and;

the photomicroprocessor is in operational communication with the motor, the motor rotatably engaging the driveshaft only when the cleaning car is in motion.

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